

**REMARKS**

Reconsideration of presently solicited supported catalyst suitable for use as a cathode in a direct methanol fuel cell Claims 4, 13, 15, 22, and 23, and presently solicited direct methanol fuel cell Claims 16, 17, 24, 25, and 28 to 31 respectfully is requested. For the reasons indicated in detail these claims respectfully are urged to specify improved technology for direct methanol fuel cells that is absent in the prior art. The presently solicited claims define new and useful improvement technology of the nature contemplated at 35 U.S.C. § 101 when specifying the various classes of patentable subject matter.

The withdrawal of each of the previously stated bases for the rejection of claims is acknowledged with appreciation.

The present invention provides a novel improved supported catalyst suitable for use as a cathode in a direct methanol fuel cell and a novel improved direct methanol fuel cell which incorporates the same. The use of a platinum catalyst in such fuel cells is acknowledged to be old in accordance with previously known technology and is known to manifest shortcomings as discussed in Applicants' Specification. As summarized at Page 2 of Applicants' Specification, various electrochemical reactions are facilitated in such fuel cells. More specifically, methanol and water react with each other to produce carbon dioxide, six hydrogen ions, and six electrons. The generated hydrogen ions travel through a hydrogen ion conducting electrolyte membrane which is positioned between the anode and the cathode to the cathode. At the cathode the hydrogen ions, electrons from an external circuit, and oxygen are caused to react to produce water. The overall reaction in such fuel cell produces carbon dioxide by the reaction of methanol and

oxygen. Through these reactions a large proportion of energy corresponding to the heat of combustion of methanol is effectively converted to electrical energy. As discussed in Applicants' Specification, the presently claimed technology of Applicants has been found by Applicants to make possible both high oxygen reduction reactivity and low methanol oxidation reactivity. This contribution of Applicants is significant and respectfully is urged to be deserving of patentable recognition, particularly in view of its absence in a reasonable reading of prior publications.

The continued rejection of presently solicited supported catalyst Claims 4, 13, 22, and 23 under 35 U.S.C. § 102(b) over the different teachings of Published U.S. Patent Application No. 2002/0034676 to Kim et al. would be lacking sound technical and legal bases. The presently solicited claims are directed to preferred embodiments of Applicants' contribution. Reference to certain alloys including an alloy of Zn and Ni has been deleted from the claims in a sincere effort to expedite prosecution. The improved supported catalyst as presently claimed which is suitable for use in a direct methanol fuel cell is urged to be absent in the reasonably derived teachings of Kim et al.

It is well established law that patentability is negated under 35 U.S.C. §102 only when the prior disclosure is identical to the invention sought to be patented. Each and every element of the claimed invention must be disclosed in a single reference in complete detail. See Akzo N.V. v. United States ITC, 808 F.2d 1471, 1 U.S.P.Q.2d 1241 (Fed. Cir. 1986); Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986); Rolls-Royce Ltd. v. GTE Valeron Corp., 800 F.2d 1101, 231 U.S.P.Q. 185 (Fed. Cir. 1986); Kloster

Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 230 U.S.P.Q. 81 (Fed. Cir. 1986);  
Great Northern Corp. v. Davir Core & Pad Co., 782 F.2d 159, 228 U.S.P.Q. 356  
(Fed. Cir. 1986); In re Donohue, 766 F.2d 531, 226 U.S.P.Q. 619 (Fed. Cir. 1985);  
W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir.  
1983); SSIH Equip. S.A. v. United States ITC, 713 F.2d 746, 218 U.S.P.Q. 678 (Fed.  
Cir. 1983); and Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 U.S.P.Q.2d 1913  
(Fed. Cir. 1989). The withdrawal of the rejection is urged to be in order and is  
respectfully requested.

The continued rejection under 35 U.S.C. § 103 of presently solicited Claims 4,  
13, 15 to 17, 22 to 25, and 28 in view of the inadequate teachings of newly cited U.S.  
Patent Publication No. 2003/0045425 to Ruth et al. in view of the inadequate  
teachings of newly cited U.S. Patent Publication No. 2002/0034676 to Kim et al.  
would be lacking sound technical and legal bases.

A detailed reading of the Ruth et al. teachings is urged to be in order. The  
product of Ruth et al. is indicated to be useful in a number of fuel cell types as well  
as for the treatment of exhaust gases from internal combustion engines. Reference  
in Ruth et al. at Paragraph No 0042 to "DMFC" is with respect to "pure platinum  
catalysts" of the prior art. Ruth et al. at Paragraph No. 16 makes reference to "noble  
metals from the group Au, Ag, Pt, Pd, Rh, Ru, Ir, Os or alloys of one or more of these  
metals". At Paragraph No. 0024 of Ruth et al. there is reference to the possibility to  
alloy the noble metals with "at least one base metal from the group Ti, Zr, V, Cr, Mn,  
Fe, Co, Ni, Cu, and Zn". Ruth et al. never suggests the use of an alloy as presently  
claimed, and is totally devoid of the recognition of the surprisingly improved results  
discussed by Applicants if such a selection were made and such alloy were utilized

in a direct methanol fuel cell on a porous support as presently claimed. The presently claimed overall subject matter and the improved results that accrue therefrom is urged to be exclusively the contribution of Applicants.

It respectfully is pointed out that Kim et al. even if read in the fullest detail does not remedy basic deficiencies in the Ruth et al. teachings. Kim et al. is concerned with a specifically defined method for producing a catalyzed porous electrode. Kim et al. never suggests the use of an alloy as presently claimed even in the different context there under discussion. Also, Kim et al. is totally devoid of the recognition of the surprisingly improved results discussed by Applicants if such a selection were made and incorporated in a direct methanol fuel cell as presently claimed. Even if the teachings of the references were combined Applicants' specifically claimed contribution still would not result.

It respectfully is submitted that a *prima facie* case for the obviousness of the presently claimed direct methanol fuel cell technology is absent in the reasonably derived teachings of the references. To establish *prima facie* obviousness of a claimed invention, all of the claim limitations and their combination must reasonably be taught or suggested in the prior art. They are not. See in this regard M.P.E.P. § 2143.3 citing In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). "All words in the claim must be considered when judging the patentability of the claim against the prior art." In re Wilson, 424 F.2d 1342, 165 U.S.P.Q. 494 (CCPA 1970). It is not sufficient as a matter of law that words can be found in different contexts by the Examiner after a reading of Applicant's teachings when they are not combined or reasonably suggested to be combined by the authors of the references.

If there is any remaining point that requires clarification prior to the allowance of the Application, the Examiner is urged to telephone the undersigned attorney so that the matter can be discussed and resolved at a personal interview.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: March 26, 2008

By:



Benton S. Duffett, Jr.  
Registration No. 22030

P.O. Box 1404  
Alexandria, VA 22313-1404  
703 836 6620